

REMARKS

In response to the Office Action dated May 26, 2009, Applicant respectfully requests reconsideration. Claims 1-3, 5-6, and 11-17 were previously pending in this application. By this response, claims 1, 2, and 5 are amended and new claims 18-27 are added. As a result, claims 1-3, 5-6, 8, and 11-27 are pending for examination with claims 1, 18, and 25 being independent claims. No new matter is added.

Objections to the Claims

Claim 1 was objected to for reciting the phrase “a upper portion of the substrate.” Applicant amends claim 1 to instead recite “an upper portion of the substrate” to addressing this objection in the manner suggested in the Office Action. Accordingly, withdrawal of this objection is respectfully requested.

Rejections under 35 U.S.C. §112

Claims 1-3, 5-6, and 11-17 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, it is stated that the terms “the border” and “the bottom of the cavity” have insufficient antecedent basis. Applicant respectfully points out that the term “the border” finds antecedent basis in line 3 of claim 1. Applicant amends each of claims 2 and 5 to address antecedent basis issues for the term “bottom” of the cavity. Accordingly, withdrawal of these rejections is respectfully requested.

Rejections Under 35 U.S.C. §102 and 35 U.S.C. §103

Claims 1-3, 5-6, 11 and 13-17 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. 6,837,476 (Cabuz). Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Cabuz. Applicant respectfully disagrees with these rejections, but nonetheless amends independent claim 1 to clarify distinctions over Cabuz.

Applicant amends claim 1 to clarify that the border is defined at an intersection between the cavity and an upper portion of the substrate. This amendment is supported at least by text at lines 9-11 on page 4 of the specification. Claim 1 also now recites that the second opening is

positioned closer to the border of the cavity than the first opening, and that the flexible membrane moves to pump air through the pumping volume.

Cabuz relates to electrostatically actuated valves that each has a closed state where fluid flow therethrough is prevented and an open state where fluid flow therethrough is allowed. The embodiment of Figs. 10-12, referenced in the Office Action, is a normally open valve that includes first port 122 and a second port 124 that provide a path for fluid flow through a chamber when the valve is open, and that prevent flow therethrough when closed. There are no other ports that provide access to the chamber that is positioned between the electrode 130 and the diaphragm 120. Each of the first and second ports 122, 124, from all appearances, are positioned equal distances from a border of a cavity.

Claim 1 recites an integrated circuit that includes a pump. A flexible membrane of the pump is moved, by the application of a voltage, to pump air through a pumping volume, rather than simply opening a passageway to allow the flow of air, as in Cabuz. The second opening positioned closer to the border of the cavity than the first opening, as claim 1 now recites, allows the second opening to be closed prior to the first opening, which allows air to be alternately drawn into the pumping volume and then pumped therefrom, unlike in valves, which lack mechanisms for moving air. In this regard, devices associated with claim 1 are distinguished from valves, that merely open close to allow and prevent the passage of air, as in Cabuz.

For at least the above described reasons, claim 1, and claims 2, 3, 5-6, and 11-17 depending therefrom are believed to be patentable. Accordingly, withdrawal of these rejections is respectfully requested.

New Independent Claim 18

New independent claim 18 incorporates features of independent claim 1, prior to this amendment, and dependent claim 12, reciting that the second opening is larger than the first opening to promote the introduction of air to the pumping volume.

In the Office Action, it is conceded that Cabuz fails to teach or disclose a second opening larger than a first opening. It is suggested however, that such a modification would be obvious in view of the statement that “a significant diaphragm travel distance may help improve the flow rate that the valve can accommodate, so long as the openings are also appropriately sized. Applicant respectfully disagrees.

As discussed above, Cabuz describes a valve through which air flows, presumably at a constant rate, when in an open position. Unlike Cabuz, claim 18 relates to a pump. Pumps operate by drawing air into a pumping chamber and then alternately pumping the air out of the chamber, through a different opening. Applicant respectfully asserts that one having ordinary skill in the art would not have designed a valve, as found in Cabuz, to have a second opening larger than a first opening to promote the introduction of air into an internal volume of a valve. To the contrary, in all likelihood a person having ordinary skill in the art would construct the first and second openings to have similar sizes to promote an even flow of air both into and out of a valve.

For at least the above described reasons, claim 18, and claims 19-24 depending therefrom are believed to be patentable.

New Independent Claim 25

A method of pumping fluid through a pumping volume in an integrated circuit chip. The method comprises, among other aspects, moving a membrane toward a conductive layer to close a second opening that otherwise provides fluid communication to a pumping volume to pump air from the pumping volume and through a first opening.

Independent claim 25 and claims 26-27 depending therefrom are believed to be patentable.

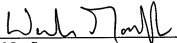
CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 23/2825 under Docket No. S1022.81158US00 from which the undersigned is authorized to draw.

Dated: 8/26/09

Respectfully submitted,

By 

Walt Norfleet

Registration No.: 52,078

WOLF, GREENFIELD & SACKS, P.C.

Federal Reserve Plaza

600 Atlantic Avenue

Boston, Massachusetts 02210-2206

617.646.8000